Analysis of DCM runs

protoDUNE

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28 November 2018

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Analysis Algorithm

○ Compute baseline
  ○ Build histogram of filtered waveforms
  ○ Take maximum
○ Find peaks
  ○ Set trigger level
  ○ Compute step function

$$f(x) = \begin{cases} 1 & \text{histo} > \text{trigger} \\ 0 & \text{histo} < \text{trigger} \end{cases}$$
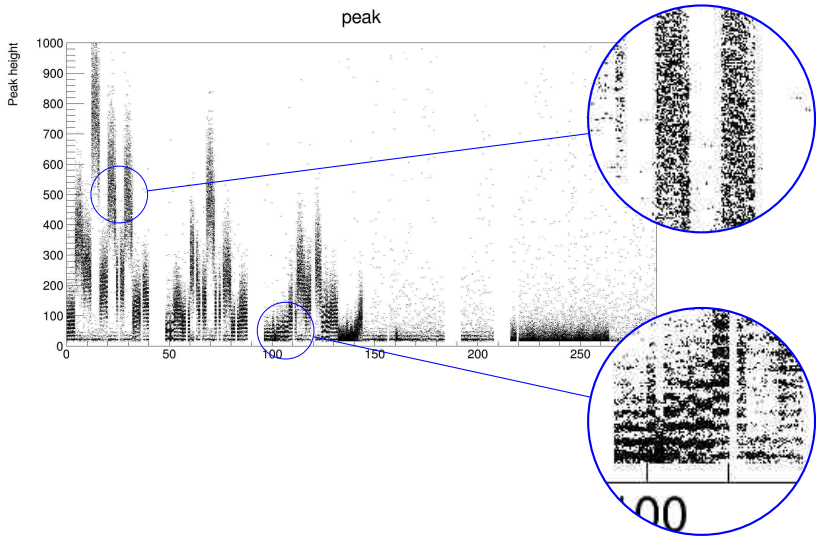
  ○ Find max inside a window after the rising edge
  ○ Check for noise fluctuation: step function must be '1' for a fixed amount of bins after the rising edge
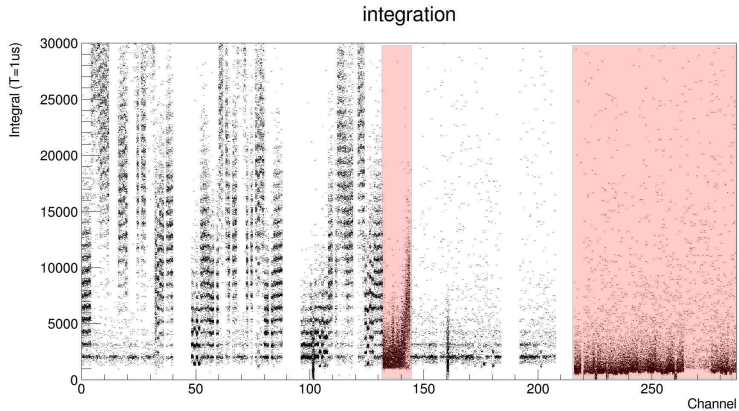○ Find peak value and integrate for fixed time
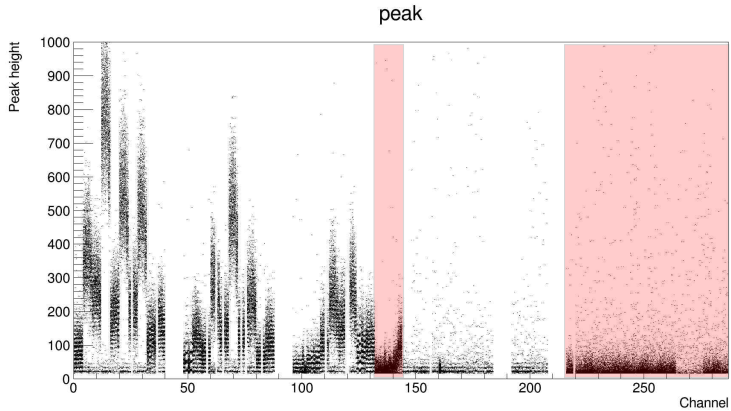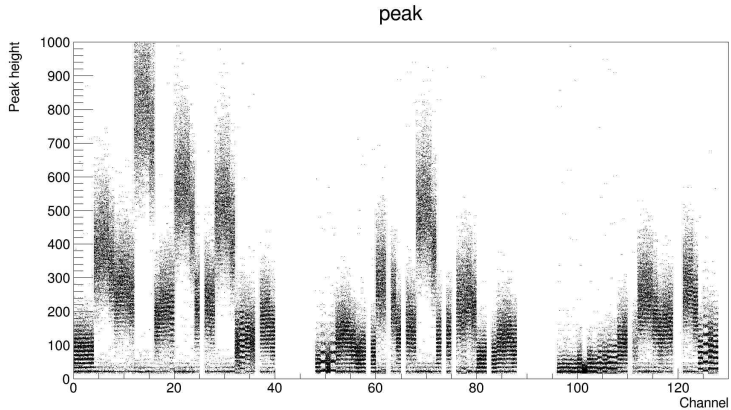
peak

np04_raw_run005896_0002_dl4.root

peak

np04_raw_run005896_0002_dl4.root
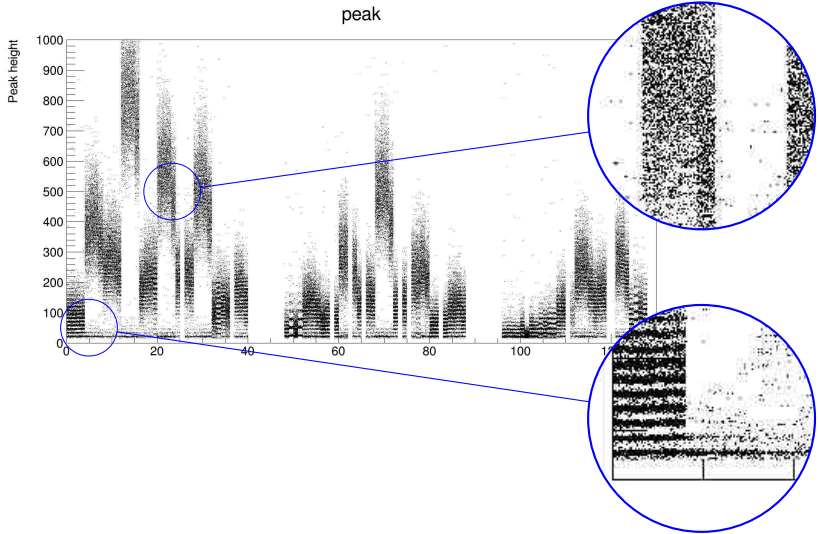
np04_raw_run005901_0001_dl1.root
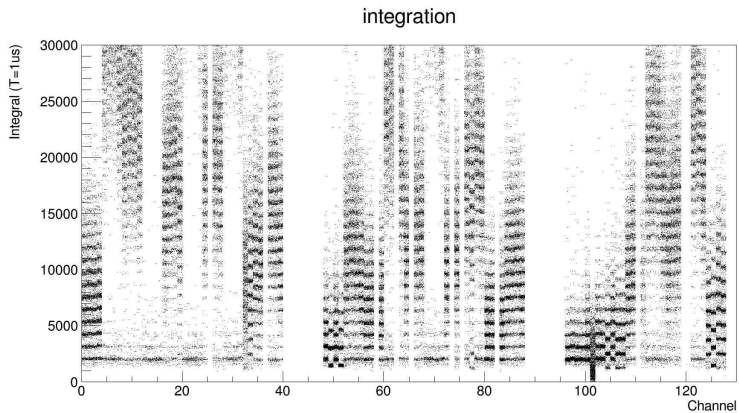
peak

np04_raw_run005901_0001_dl1.root

Conclusions

○ Very promising DCM runs
○ With SensL technology very clear peaks and integral identification for most of the sensors
○ Some SensL SiPM show "uniform" distribution at high ADC counts. Correlation with LED position?
○ Poor results with Hamamatsu
  ○ Few statistics with respect to the others?
  ○ Bad waveforms or too different from SensL? New approach/different tuning?
  ○ Still investigating...